UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte BARRIE GILBERT

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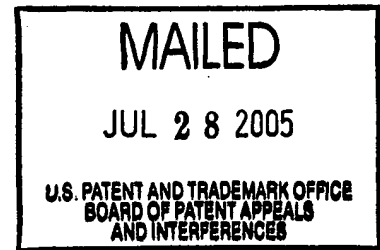Appeal No. 2005-1218
Application No. 09/694,731

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ON BRIEF

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U.S. PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS
AND INTERFERENCES

Before BARRETT, GROSS and NAPPI, **Administrative Patent Judges.**

NAPPI, **Administrative Patent Judge.**

DECISION ON APPEAL

This is a decision on the appeal under 35 U.S.C. § 134 from the examiner's rejection of claims 1, 3, 5 through 7 and 15. For the reasons stated *infra* we reverse the examiner's rejection of these claims.

The Invention

The invention relates to a method of operating a squaring circuit that provides a good square-law approximation when the input signal is limited to less then plus or minus four (4) times the bias current of the circuit. See page 4 of appellant's specification.

Claim 1 is representative of the invention and is reproduced below:

1.   A method for operating a transistor cell comprising an input terminal for receiving an input signal, an output terminal for transmitting an output signal, a grounded base transistor coupled between the input and output terminals, and a current mirror coupled between the input and output terminals, the method comprising:
    biasing the transistor cell to establish a bias current in the grounded base transistor and the current mirror when the input signal is zero; and
    limiting the input signal to a range in which the output function of the transistor cell approximates a square-law.

References

The reference relied upon by the examiner is:

Hofmann   4,250,457   February 10, 1981

Rejections at Issue

Claims 1, 3, 5 through 7 and 15 stand rejected under 35 U.S.C. § 103 as being unpatentable over Hofmann. The examiner's rejection is set forth on pages 3 and 4 of the answer. The examiner has indicated that claims 4, 8 through 12 and 14 contain allowable subject matter.

Opinion

We have carefully considered the subject matter on appeal, the rejection

advanced by the examiner and the evidence of obviousness relied upon by the

examiner as support for the rejection. We have, likewise, reviewed and taken into

consideration, in reaching our decision, the appellant's arguments set forth in the briefs,

along with the examiner's rationale in support of the rejection and arguments in rebuttal

set forth in the examiner's answer. With full consideration being given to the subject

matter on appeal, the examiner's rejection and the arguments of appellant and

examiner, for the reasons stated *infra*, we will not sustain the examiner's rejection of 1,

3, 5 through 7 and 15 under 35 U.S.C. § 103.

Appellant argues, on page 3 of the brief, "Hofmann does not disclose or suggest

limiting the input signal in any way. In fact, as will be discussed below, Hofmann

actually discloses the desirability of using a large input signal to achieve a linear

response, thereby *avoiding* a square-law response." Appellant states, on pages 3 and

4 of the brief, that the equation that the examiner relies upon, in column 5, lines 15-18

of Hofmann, is "essentially the same as Eq. 1 at page 4, line 10 of Applicant's

specification, except for minor differences in notation." Appellant asserts, on page 4 of

the brief, that cells which are modeled by this equation have two modes of operation,

when the input is less then ±4 times the bias current, the cell's output is non-linear and

a good square law approximation, and when the input is greater, the cell's output is

linear and produces an approximation of an absolute value circuit. Appellant argues,

on page 4 of the brief, that Hofmann teaches operating the circuit in the linear region and teaches away from limiting the input signal to a specific range that provides a square-law approximation and provides no suggestion to make such a modification.

In response, the examiner asserts, on page 5 of the answer:

> As shown in Hofmann's figure 3, when the input signal is relatively small, i.e. Iin is in the range of −1.5 to 1.5, the cell provides a square-law, and when the input signal is relatively large, i.e. Iinl is greater than 1.5, the cell provides a linear function. It is clear from Hofmann's graph and equation in column 5, lines 15-18, that the circuit will provide a square law function as called for in claim 1. Therefore, it would have been obvious for one having ordinary skill in the art to limit the input signal of Hoffman to be relatively small in order to provide an output function of the cell that approximates a square law.

We find, as appellant admits, that Hofmann's equation in column 5, lines 15-18, is the same as Eq. 1 on page 4 of appellant's specification, and as such we find that Hofmann implicitly teaches that the output of the circuit will approximate a square law over a range of input currents. However, claim 1 contains the limitation of "limiting the input signal to a range in which the output function of the transistor cell approximates a square-law." Thus, the scope of claim 1 includes a method of using the circuit only when the input signal is limited to a range. We find that Hofmann teaches operating the device over the range of all possible input currents and is primarily concerned with operating in the linear region. See column 2, line 1. Thus, the question is not a question of whether the range claimed is within the range taught by Hofmann; we find the question is whether the reference teaches or suggests the method step of limiting the range as claimed.

We disagree with the appellant's assertion that Hofmann teaches away from the claimed invention. Our reviewing court has said "[A] reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be lead in a direction divergent from the path that was taken by the applicant. The degree of teaching away will of course depend upon the particular facts; in general, a reference will teach away if it suggests that the line of development flowing from the reference's disclosure is unlikely to be productive of the result sought by the applicant." *In re Gurley*, 27 F.3d 551, 553, 31 USPQ2d 1130, 1131 (Fed. Cir. 1994) (*citing United States v. Adams*, 383 U.S. 39, 52, 148 USPQ 478, 484 (1966)). However, a reference that "teaches away" does not *per se* preclude a *prima facie* case of obviousness, but rather the "teaching away" of the reference is a factor to be considered in determining unobviousness. *Id* 27 F.3d at 552, 31 USPQ 2d at 1132. In this case we find that Hofmann's disclosure is directed to operating in the linear region to produce a square root of the sum of the square of the input, i.e., output an absolute value of the input, and addresses methods of increasing the range of the linear output. See col. 2, lines 59 –67 and column 6, lines 3-10. However, we do not find that Hofmann teaches that it is undesirable to operate the circuit in the region where the output is a square law approximation of the input, the non-linear region. Thus, we do not find that Hofmann teaches away from operating in the non linear region.

Nonetheless, we are convinced by appellant's argument that Hofmann contains

no teaching or suggestion to limit the input signal to a range of values which in which

the output function approximates a square law. An obviousness analysis commences

with a review and consideration of all the pertinent evidence and arguments. "In

reviewing the [E]xaminer's decision on appeal, the Board must necessarily weigh all of

the evidence and arguments." *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443,

1444 (Fed. Cir. 1992). "[T]he Board must not only assure that the requisite findings are

made, based on evidence of record, but must also explain the reasoning by which the

findings are deemed to support the agency's conclusion." *In re Lee*, 277 F.3d 1338,

1344, 61 USPQ2d 1430, 1434 (Fed. Cir. 2002). When determining obviousness, "[t]he

factual inquiry whether to combine references must be thorough and searching." *Lee*,

277 F.3d at 1343, 61 USPQ2d at 1433, *citing McGinley v. Franklin Sports, Inc.,* 262

F.3d 1339, 1351-52, 60 USPQ2d 1001, 1008 (Fed. Cir. 2001). "It must be based on

objective evidence of record." *Id.* "Broad conclusory statements regarding the teaching

of multiple references, standing alone, are not 'evidence.'" *In re Dembiczak*, 175 F.3d

994, 999, 50 USPQ2d 1614, 1617. "Mere denials and conclusory statements, however,

are not sufficient to establish a genuine issue of material fact." *Dembiczak*, 175 F.3d

at 999, 50 USPQ2d at 1617, *citing McElmurry v. Arkansas Power & Light Co.,* 995

F.2d 1576, 1578, 27 USPQ2d 1129, 1131 (Fed. Cir. 1993). The Federal Circuit states

that, "[t]he mere fact that the prior art may be modified in the manner suggested by the

Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." *In re Fritch*, 972 F.2d 1260, 1266 n.14, 23 USPQ2d 1780, 1783-84 n.14 (Fed. Cir. 1992), citing *In re Gordon*, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984). In addition, our reviewing court stated, that when making an obviousness rejection based on combination, "there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by Applicant" in *Lee,* 277 F.3d at 1343, 61 USPQ2d at 1433 (quoting *In re Dance*, 160 F.3d 1339, 1343, 48 USPQ2d 1635, 1637 (Fed. Cir. 1998)). The examiner has not provided any objective evidence that teaches or suggests a method of limiting the input signals, to the circuit of Hofmann, to a range in which the output function of the transistor cells approximates a square-law. Rather, the examiner has merely provided the conclusory statement, "it would have been obvious..." without providing the factual objective evidence to support the conclusion. Accordingly we will not sustain the examiner's rejection of claims 1, 3, 5 through 7 and 15 under 35 U.S.C. § 103.

No time period for taking any subsequent action in connection with this appeal

may be extended under 37 CFR § 1.136(a).

REVERSED

LEE E. BARRETT   )
Administrative Patent Judge   )
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ANITA PELLMAN GROSS   )   BOARD OF PATENT
Administrative Patent Judge   )   APPEALS AND
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ROBERT E. NAPPI   )
Administrative Patent Judge   )

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